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DISPOSAL OF CITY GARBAGE BY FEEDING TO HOGS

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THE Department of Agriculture has under way a study of the situation with respect to the feeding of city garbage to hogs, including the best methods of handling, the feeding and fattening of stock, the most efficient and sanitary arrangement of equipment, the comparative value of garbage as a hog ration, and the economy of garbage disposal by feeding to hogs compared with systems of disposal by incineration, rendering, dumping, or burying. The investigation will extend to all parts of the United States.

The work thus far has been mainly in the vicinity of the larger cities in the Eastern States, namely, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, and Maryland. In addition attention has been given to a garbage feeding plant near Grand Rapids, Mich., and to hog-feeding operations carried on near Denver, Colo., St. Louis, Mo., and Los Angeles, Cal.

THE DISPOSAL OF CITY GARBAGE BY FEEDING TO HOGS.

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CONVERSION OF A GREAT WASTE INTO AN EDIBLE PRODUCT.

GARBAGE has been fed to hogs in a number of places with varying degrees of success, and the information given in this publication, although incomplete, will familiarize interested persons to the extent that they can see the possibilities in this business if it is intelligently managed.

Reports in the possession of the Department of Agriculture show that where table scraps form a part or all of the pig's diet, the gains cost considerably less than the gains made by their grain-fed competitors. On the other hand, while many people recognize in hog feeding the possibility of a cheaper disposal of garbage than by rendering, incinerating, dumping, etc., there is no reliable and complete source of information on the subject. The department began the study of this problem to determine whether there is an opportunity for a conservation of city waste by feeding it to hogs, thus giving back to the city a supply of food in the form of pork, and at the same time affording the city a more economical and efficient method of garbage disposal.

The report of a special commission on the "Collection and Disposal of Municipal Waste," Worcester, Mass., shows the cost per capita per annum for the collection and disposal of garbage in 17 cities of the United States. Seven of these cities feed their garbage to hogs; the other 10 dispose of it by other methods, such as incineration, reduction, burial, etc. The average cost per capita per annum for those feeding garbage is about $0.116, and the average cost for the other 10 $0.337, a saving of $0.221 per capita per annum. If these averages are confirmed by reports from a large number of cities, it would seem that hogs as garbage converters could directly save the people in the cities of the United States enormous sums of money annually, and add a not inconsiderable amount to the meat supply of the Nation.

While these averages can not be taken as absolute for the whole country, they are a strong indication of the possibilities. At no time in our history has the elimination of waste been a more emphatic necessity than at present. If, entirely aside from effecting an economy in city management, the garbage produced in cities and towns can be used profitably in pork production, every effort should be made to convert it to this purpose.

GARBAGE.

Garbage ordinarily is table refuse, scraps, peelings, fruit remnants, spoiled food, etc., and is rather variable in composition. Sufficient analyses have not been made to warrant a definite statement regarding chemical composition or feeding value compared with grains or commercial feeds. One analysis made by the New Jersey Experiment Station is as follows:

Composition of garbage.

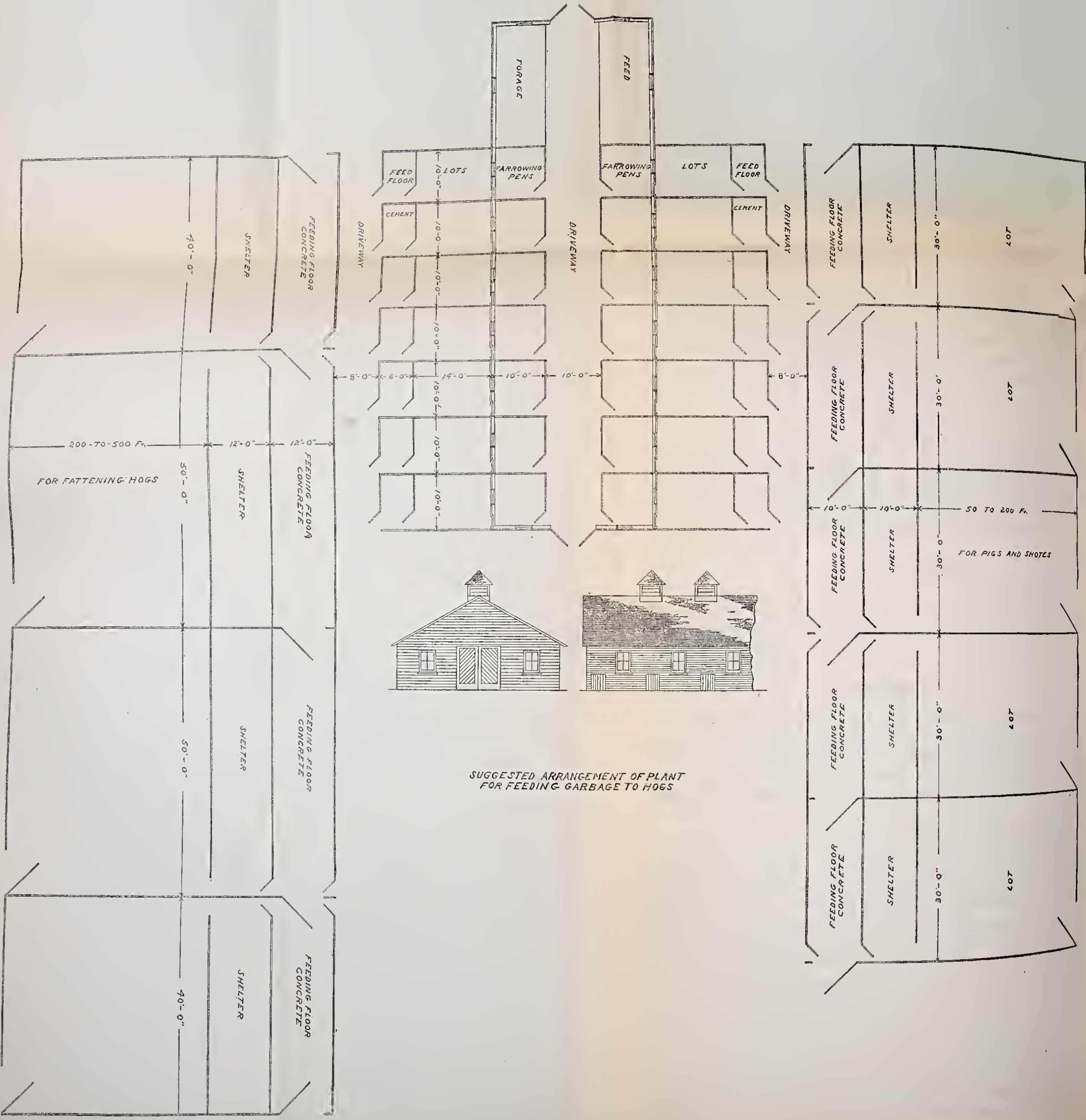
	Per cent.
Water	70. 0
Grease	3. 5
Potash	. 3
Bone phosphate	1. 0
N in form of NH_3	1. 0

EQUIPMENT.

Garbage-feeding enterprises vary widely in equipment and in plan of operation, depending upon the size of the adjacent city, the amount of garbage collected, the number of hogs fed by each individual, local sanitary regulations, and the ideas of different operators. No well-established standard is in use, as regards either equipment or plan of operation.

In the larger and more efficiently arranged plants the feeding pens are placed side by side, fronting a central driveway, through which the garbage is hauled. That part of the pens adjacent to the drive should be built with a concrete feeding floor upon which the garbage may be thrown. Generally this floor is surrounded with a rim to keep the garbage upon the floor. Some feeders prefer troughs. In either case the concrete flooring is of much assistance in keeping premises properly cleaned and free from rats. Plank flooring may be used, but as it becomes worn the nailheads protrude and cause difficulty in scooping up refuse, cracks appear, boards are broken, and garbage collects under the platform, causing odors, vermin, and disease. In addition the platform affords an ideal harbor for rats.

The pens should front from 10 to 40 feet, depending upon scale of operations, cost of construction, value of land, and age and character of stock. A greater number of mature hogs than of pigs may be kept together without increasing the danger from disease. The sleep-



SUGGESTED ARRANGEMENT OF PLANT
FOR FEEDING GARBAGE TO HOGS

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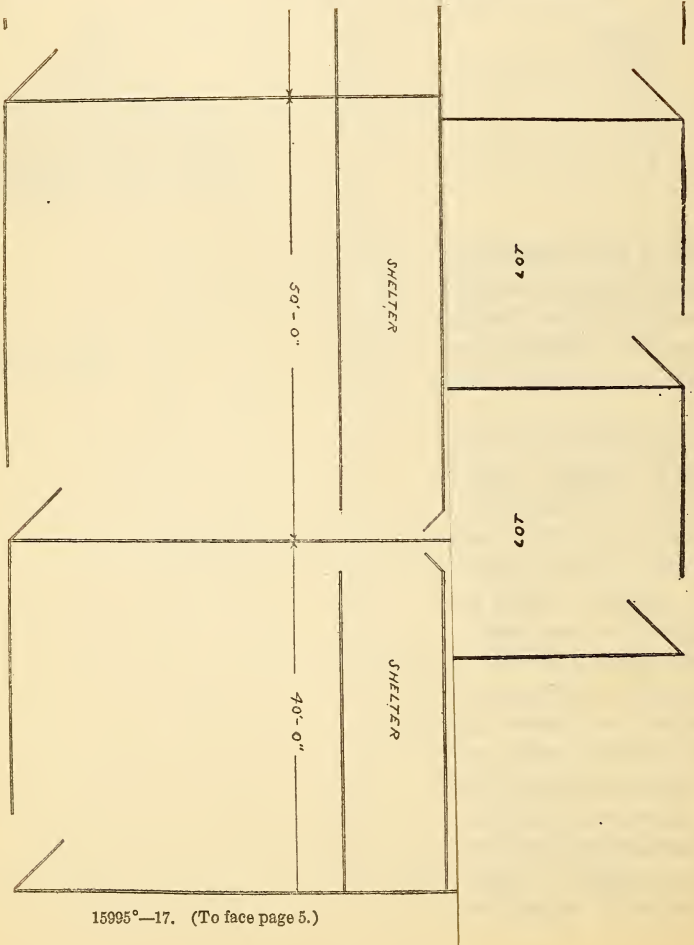

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ing quarters may be constructed just back of the feeding floor and in this way the refuse garbage and the manure from the hogs may be collected at one operation. Each pen should be supplied with a lot or, if possible, a pasture. This furnishes a place for exercise and in some cases it may be possible to supply the hogs with a crop of rape, soy beans, or some other green forage. The pens should be so supplied with gates as to permit the passing of a wagon directly through them to facilitate cleaning and movement of hogs, and so constructed that the hogs can be easily shut off the feeding floors while garbage is being dumped on and again while floors are being cleaned.

In the plan shown in the diagram it is sought to arrange gates so that wagons may pass across feeding floors of all but those of farrowing pens in order that the floors and the shelters may be cleaned at the same trip. Gates are also provided to keep animals off floors while garbage is being unloaded, and also during the cleaning process. The pens for fattening hogs and young stock are of various sizes, because it has been found practicable to keep fattening hogs and brood sows in larger numbers than are safe in the case of young stock.

The farrowing pens and lots are arranged between the lots for other stock. For a large establishment this plan is very convenient, but if hogs are purchased and fattened and no stock raised the central building can be omitted and the fattening pens built on each side of a central drive. The farrowing pens can be built at any convenient place about the premises.

The plan is not intended to fit every case, neither is it complete in all details. Scale and plan of operations, topography of land, available capital, convenience, etc., are factors which should determine the arrangement of pens, houses, and other equipment.

No definite set of plans and specifications will fit every case. Circumstances must govern the extent and arrangement of equipment.

Where cooking is practiced the expense of equipment and operation is increased considerably. In some of the smaller establishments live steam is piped to the bottom of ordinary covered barrels or vats and released. In larger plants boilers of considerable size are used, and these with the necessary accompanying equipment frequently cost from $400 upward. The total cost of equipment for a garbage feeding plant may vary from a few hundred dollars to ten or fifteen thousand, depending upon methods of construction, materials, and scale of operation.

COLLECTION OF GARBAGE.

Some feeders collect the garbage directly from the city residences, hotels, and restaurants at their own expense and find the business profitable, while in other cases the garbage is collected at the city's expense and delivered to a central station, from which the farmers or feeders haul it to their farms. In the vicinity of certain towns in Massachusetts the garbage is collected by one man and the surplus beyond his immediate needs sold at 4 cents per cubic foot. In the instances investigated it seems that an arrangement whereby the city collects the garbage and the feeder disposes of it is of profit and convenience to both parties. Where the feeder goes to greater expense in collection his profits are decreased correspondingly.

A very satisfactory method of collection consists in the use of covered water-tight steel or wooden bodies, mounted on trucks, into which the garbage is dumped from the hotel or residence cans. If shipment to farms is necessary, the tank bodies should be so constructed that they may be either loaded on flat cars by cranes or dumped by machinery into tank cars. The feeder should see that his garbage consists only of table scraps, refuse food, peelings, etc., and that no bottles, paper, floor sweepings, cans, etc., are included. The expense of collection and transportation varies to such an extent with different conditions that an estimate is impossible here. Two men with one team, however, should collect enough garbage from hotels and restaurants for 150 to 250 hogs. Garbage from hotels and eating places should be collected daily; that from residences at least three or four times per week in summer and twice a week in winter.

QUANTITY OF GARBAGE CONSUMED.

Approximately 15 to 20 pounds of garbage are required per day for a fattening hog of 125 to 200 pounds, depending upon the character of the garbage. It has been estimated that 4 tons of garbage are required to grow a pig to 200 pounds, the feeding period extending from 10 to 12 months. A common practice in feeding is to dump the garbage on feeding floors as early as possible in the morning, and turn on the fattening hogs, which are permitted to remain until afternoon. Following these come the sows and young stock, which clean up the floors during the night. In the morning the feeding floors and sleeping quarters are cleaned of refuse, garbage, and manure, respectively, before the fresh garbage is unloaded. The refuse garbage and manure may be disposed of by use of compost piles, a very satisfactory method, or by spreading at once upon the land. In the latter case the material must be plowed under or covered promptly, as it soon becomes a nuisance.

COOKED VS. RAW GARBAGE.

The cooking or sterilizing of garbage is good practice because it makes possible the separation of the grease contained, which some feeders claim does not add to the feeding value and is in part injurious to the hogs. This grease is sold for from 10 to 14 cents per pound and in the larger establishments is an important source of income. Cooking also removes all danger of infecting hogs with disease germs or parasites, such as tubercle bacilli and trichinæ. On the other hand, cooking is an expensive operation and is regarded by many successful feeders as useless and even injurious, partly owing to the formation of organic acids. Cooking the garbage causes all the material contained to be so thoroughly mixed that it is impossible for the hogs to practice selection in eating. The argument is advanced that a hog will balance his ration on raw garbage, whereas if the material is cooked he is compelled to eat everything without regard to his appetite. It would seem from the information obtained thus far that cooking is not essential in summer if garbage is clean and is fed promptly. However, the practice is advisable in winter, when the garbage contains a higher percentage of grease which can be removed in the cooking process. When a part of the garbage is frozen, cooking renders it more palatable and available, at the same time making it possible to supply young stock with warm feed.

RELATION TO DISEASE.

Garbage-fed hogs are exceptionally free from lice and intestinal parasites, and when fed upon sterilized or cooked garbage they have been found to be as free from disease as other hogs bought on the open market. Some feeders have reported a very low percentage of tubercular or trichinæ-infested hogs where only raw garbage is used, while in other instances pronounced tubercular and trichinæ infestation has been found. It is a noteworthy fact that hogs are very susceptible to bovine tuberculosis, and therefore it is unsafe to feed raw garbage which contains milk from any but healthy cows. Similarly, while it is true that numerous garbage-fed hogs have been found to be free from trichinæ, if garbage contains raw pork scraps the hogs feeding upon that garbage are sooner or later sure to become infested, as statistics have shown that 1.4 per cent of all hogs slaughtered in the United States carry the trichina parasite in some stage. Therefore while it might be possible under the most careful and sanitary measures to feed raw garbage with freedom from disease and parasites, still as a precautionary measure sterilization or cooking is advised.

Owing to the nature of the feed, garbage-fed hogs require very careful protection from cholera. Unless the premises are kept in the most sanitary condition and all refuse food is collected and disposed of carefully and promptly, cholera is likely to cause serious loss. However, with proper sanitation, innoculation, pure water, and exercise, cholera need not cause serious loss.

The presence of dishwater in garbage usually results in digestive and intestinal disorders caused by the alkali washing powders. Frozen garbage should never be fed, as it usually causes death to the animals consuming it.

All glass should be removed, if possible, to prevent slitting of the intestines.

Decayed or fermented garbage will cause serious digestive disorders if fed in appreciable quantities.

BREEDING STOCK.

It is a current opinion that "garbage-bred" stock is essential to a successful feeding establishment. Grain-fed stock is subject to digestive disorders when transferred to a garbage ration. The most successful feeders usually maintain their own herds of breeding stock and in this way their pigs are raised upon and thoroughly adjusted to a garbage ration when the fattening period arrives.

Separate breeding and farrowing quarters should be maintained for sows. A very high mortality among weanling pigs has been noted by eastern feeders. This is probably caused by their digestive systems being less resistant to the effects of cold and damp quarters. The first litters are considered the poorest, while the second and third are somewhat better. How long stock should be retained in the breeding herd depends upon the individual merit of the animals and the personal opinion of the breeder.

TREATMENT FOR CHOLERA.

The majority of eastern feeders practice the simultaneous treatment for cholera vaccination which may be accounted for by the fact that the premises are thoroughly infected with hog-cholera germs. Under the most sanitary practices the single treatment may be sufficient to keep the herds free from disease. If the feeder observes signs of an epidemic, the premises should be immediately cleaned, disinfected, and all animals from 2 to 3 weeks up, vaccinated.

CHARACTER OF MEAT.

While garbage-fed hogs sometimes are docked from one-fourth to 1 cent per pound on the eastern markets, this discrimination is not universal.

It is a frequent observation that hogs fed exclusively on garbage or swill have a softer and more oily flesh than grain-fed animals. Decayed or badly fermented garbage is likely to cause strong and rancid pork. If garbage is fed in good condition with proper surroundings, there is no reason why pork from this source should not compare favorably with that from grain-fed hogs.

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